

SUBSTITUTE SPECIFICATION: CLEAN VERSION

14219-080US1/ P2002,0843USN

U.S. Application No. 10/530,507

Substitute Specification

Approved for Entry

2/26/2009

BS

BULK ACOUSTIC WAVE RESONATOR AND CIRCUIT COMPRISING SAME

TECHNICAL FIELD

This patent application describes a resonator operating with bulk acoustic waves
5 (or FBAR, Thin Film Bulk Acoustic Wave Resonator), also known as BAW resonator
(Bulk Acoustic Wave Resonator), as well as a circuit constructed of such resonators.

BACKGROUND

BAW resonators are suitable, in particular, for band-pass high-frequency filters in
10 modern filter technology, and can be used, for example, in mobile communication
devices.

A resonator operating with bulk acoustic waves has a piezoelectric layer that is
disposed between two metal layers (electrodes). A sequence of layers can also be used
15 instead of only one piezoelectric layer. The layers are deposited consecutively on a
substrate and structured into resonators, that are electrically connected to one another and
together can constitute, for example, a filter circuit especially a band-pass filter. Such a
band-pass filter can also be used together with another filter in a duplexer.

20 Figure 1 shows the equivalent circuit diagram of a BAW resonator. Outside a
frequency range surrounding the resonant frequency, the resonator is characterized by a
static capacitor C_0 and, in proximity to the resonant frequency, by the series connection of